

January 18, 1974

MEMORANDUM OF INDUSTRY SUGGESTIONS

(1) The first area in which the Commission can improve its laboratory operations relates to the deleting or discarding of data. Dr. Arkin's analyses of the Commission results indicate that a large number of all the Commission's reported values were discarded or deleted in one of two ways. The first involves values which were recorded on the data sheets, stamped "Deleted," and not included in the calculations. The second relates to values which were recorded on the data sheets and were discarded by making a new run and pasting the new values over the old. We would urge the Commission that sound laboratory technique demands that all values be recorded, and that no values be discarded or pasted over.

In addition, all values should be included in the final calculation except those values for which there is some known laboratory failure, such as a flask has been dropped or solutions were improperly added, etc. If there has been no known failure in laboratory operations, then the values should be included in the final result.

We recognize that in certain laboratory testing "outlier" techniques are employed for discarding values which differ too greatly from the mean. Use of this technique cannot justify the Commission's deletions because

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far too many values have been deleted, and an "outlier" technique only permits the discarding of a relatively small number of values.

In addition, we would urge the Commission that in dealing with cigarette testing, where there are variations in the natural product as well as in conditions of storage, use of the outlier technique is not proper and all values should be included in the calculation except those for which some known experimental failure occurred. We would also urge the Commission, in the interests of ensuring the integrity of its testing operation, to employ notebooks rather than cards to record laboratory results. If the Commission laboratory continues to use cards, each card should be numbered sequentially.

(2) The second area in which the Commission could improve its laboratory operations relates to the smoking of cigarettes and the performing of chemical determinations on the condensate. In analyzing the Commission results on each round of testing, and comparing those results with the results of TITL, we have concluded that the laboratories are generally in good agreement, but they sometimes differ considerably in "tar" or nicotine. In one case, the source of a variance in "tar" results may have been due to the fact that the Commission's laboratory was not operating at the humidity required by the

methodology and that its humidity control was not sufficiently accurate.

We are not interested in discussing this specific humidity problem in detail, and we understand, based upon discussions between industry and Commission staff, that this problem in the Commission's laboratory has been corrected. This demonstrates, however, the necessity for the Commission laboratory to maintain some system of controls in order that it can determine during the course of a run when some problem has occurred in equipment or in testing technique which will adversely influence the results. It is not sufficient to wait until the tests have been completed and the results have been published.

Accordingly, it is suggested that the Commission use its monitor results for this purpose in the following manner: At the beginning of each market sample test the Commission laboratory could make a sufficiently large number of runs with just monitor cigarettes, and in this way it could determine the "true value" for the monitors when smoked in the Commission laboratory. It is suggested that the Commission then discuss this "true value" with TITL to compare the value obtained by TITL on the same monitor cigarettes with that obtained by the Commission.

The Commission would then smoke monitor cigarettes with each run of brand cigarettes (as it now does).

If, during the smoking, the results for the monitor cigarettes exceeded a statistically established quality control limit, then the Commission laboratory would stop smoking brand cigarettes and attempt to investigate what had caused this shift in monitor values.

Once the cause of the problem has been satisfactorily resolved, the Commission would then begin smoking monitor and brand cigarettes again. This suggestion would not only ensure that the Commission could ascertain experimental failures and avoid having them influence results; it would also satisfy a basic criticism of the Commission's laboratory operations which has been repeatedly raised by Dr. Arkin in his various critiques of the Commission's results. Dr. Arkin, by analyzing the Commission's monitor values, has found that in different periods during the same run of smoking, monitor results vary widely, indicating that there has been some basic change in the Commission's laboratory procedures which is causing wide variations in brand results as well.

(3) The third point for discussion with the Commission relates to the Commission's handling of data. In Dr. Arkin's earlier reports made available to the Commission, it was indicated that there were a great number of calculational errors in the results. These have been reduced to a relatively small number in later reports,

but there are still some calculational errors. This should encourage the Commission to utilize some technique of calculation, such as computerizing the calculations, which would totally eliminate these errors. In addition, as Dr. Arkin has observed, some of the numbers which appear on the Commission's data sheets are not legible, some digits have been omitted, and some numbers have been improperly copied on the summary sheets. Without wishing to be unduly critical of the Commission staff, it is respectfully suggested that additional supervision of the activities of Commission laboratory personnel in recording and working with the data (as well as in the other operations) would ensure a more careful job by Commission technicians.

(4) The fourth point for discussion relates to the Commission's procedure for rounding figures. In the last test there was apparently a second rounding in some cases and this produced errors and discrepancies in some results. It is hoped that a discussion of the Commission's rounding procedure could eliminate this problem in the future.